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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/541,776   | 07/08/2005  | Toshihiko Ohashi     | 0216-0516PUS1       | 1474             |
| 2252   | 7590        | 02/14/2011           |                     |                  |
| BIRCH STEWART KOLASCH & BIRCH<br>PO BOX 747<br>FALLS CHURCH, VA 22040-0747 |             |                      |                     | EXAMINER         |
|  |             |                      |                     | CHANG, VICTOR S  |
|  |             | ART UNIT             | PAPER NUMBER        |                  |
|  |             | 1788                 |                     |                  |
|  |             | NOTIFICATION DATE    | DELIVERY MODE       |                  |
|  |             | 02/14/2011           | ELECTRONIC          |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

|                              |                        |                     |
|------------------------------|------------------------|---------------------|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |
|                              | 10/541,776             | OHASHI ET AL        |
|                              | <b>Examiner</b>        | Art Unit            |
|                              | VICTOR S. CHANG        | 1788                |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on **24 January 2011**.
- 2a) This action is **FINAL**.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) **1,3,5,7-14 and 16** is/are pending in the application.
  - 4a) Of the above claim(s) **7-13 and 16** is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) **1,3,5 and 14** is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

|  |  |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-878)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____   |

**DETAILED ACTION**

**Introduction**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's declaration, amendments, and remarks filed on 1/31/2011 have been entered. Claims 1 and 14 have been amended. Claim 15 has been cancelled. Claims 1, 3, 5 and 14 are active.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. The grounds of rejection not maintained are withdrawn.

**Rejections Based on Prior Art**

4. Claims 1, 3, 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lange et al. (US 4816333) in view of Takahashi et al. (US 6251523).

Lange's invention relates to an antireflective polymeric or glass substrate having a porous silica coating thereon. See col. 2, lines 36-42; col. 3, lines 7-10; col. 4, lines 11-55; Examples 1 and 13. The porous coating comprises a continuous gelled network of voids between the silica particles. The gelled network is formed from a colloidal solution of silica particles. When dried, the silica coating has an open porosity of about 25 to 70 percent, and has a refractive index

between 1.20-1.30. The average primary particle size of the colloidal silica particles is less than 200 Å (20 nm), preferably less than about 70 Å to achieve good adhesion (abrasion resistant) of the coating to the substrate and antireflection properties. Fig. 2 illustrates the antireflective property of a silica coated polyethylene terephthalate (PET) film.

For claims 1 and 3, Lange lacks a teaching of making an antireflection coating from a colloidal solution comprising chain silica fine particles (moniliform silica strings). However, Takahashi's invention relates to a coating on glass windows having small reflectivity (antireflection) at high incident angle for an improved visibility. The coating is formed from a colloidal solution comprising chain silica fine particles and 5 to 30 wt% silica based on the weight of said chain silica fine particles. See col. 1, ll. 55-61. The coating liquid contains chain silica fine particles and at least one silicon compound selected from the group consisting of a hydrolyzable and condensation polymerizable organic silicon compound, chlorosilyl group containing silicon compound, and their hydrolyzates. See col. 4, ll. 60-65. Space (void or pore) is formed between the mutually adjacent chain silica fine particles in the coating. The coating has a refractive index of 1.25 to 1.40. Dents and projections caused by the chain silica fine particles are formed on the surface of the coating. See col. 1, ll. 66 through col. 2, ll. 8. A large number of gaps of 5 to 20 nm width are formed between the adjacent chain fine particles in the coating. These large numbers of gaps have exceedingly large gross volume in comparison with the gaps made on supposition of using the same amount of spherical silica fine particles in place of the chain silica fine particles. The low refractive index of the coating approaches the theoretical value (1.225) required for obtaining zero reflectance for glass substrate. See col. 2, ll. 20-37. The void volume (porosity) of the coating is between 50 to 80%. See col. 2, ll. 48. The

size of the chain silica fine (primary) particles is preferably of an average diameter of 10 to 20 nm and an average length of 60 to 200 nm. The silica film is formed by drying at a temperature in the range of room temperature (interpreted as ca. 25° C) to 200° C for 1 minute to 2 hours. According to necessity, heat treatment may be given at a temperature between 400°C and 750°C for 5 seconds to 5 hours, by which the silica film on the surface of the glass substrate becomes strong (greater hardness). See col. 7, ll. 28-34. It would have been obvious to one of ordinary skill in the art to modify Lange's coating with Takahashi's chain silica fine particles, motivated by the desire to obtain an improved antireflection coating. Regarding the hardness, minimum reflectance and the structural relationship (described by the claimed equation) between various structural elements of the coating, since the collective teachings of prior art render the general structure, composition, and process of making of the claimed invention obvious, these properties are deemed to be obvious routine optimization to one skilled in the art, motivated by the desire to obtain required properties for the same end uses as the claimed invention.

For claim 5, Lange teaches the same PET substrate for the same use as the instant invention. The hardness of the substrate is deemed to be inherent to the PET film.

For claim 14, since it is of the same scope of structure and composition as the claims rejected above, it is also rejected for the same reasons.

#### **Response to Argument**

5. Applicants argue at Remarks page 13:

in all of the Examples of Takahashi, a coating composition is prepared by a method in which the "chain silica colloid" (moniliform silica strings) is mixed with the "hydrolytic condensation polymerization liquid of ethyl silicate", which means that the hydrolyzable group-containing silane (ethyl

silicate) has been subjected to hydrolysis and dehydration-condensation prior to mixing thereof with moniliform silica strings.

However, Takashashi specifically teaches:

The coating liquid contains chain silica fine particles and at least one silicon compound selected from the group consisting of a hydrolyzable and condensation polymerizable organic silicon compound, chlorosilyl group containing silicon compound, and their hydrolyzates. See col. 4, ll. 60-65.

Clearly, Takahashi's teaches a coating liquid having hydrolyzable group-containing silane and/or their hydrolyzates, therefore the chain silica (moniliform silica) is mixed with the silane either before and/or after hydrolysis. Since Takashashi's teaching is not limited by the Examples, applicants' argument fails to exclude Takahashi.

Applicants argue at page 15:

it is very surprising and unexpected that the silica film of the present invention has a very low refractive index (1.22 or more to less than 1.30) but still exhibits a pencil hardness of 2H or higher. Since the pencil hardness of an antireflection film formed of silica particles is generally about 3H at the highest, the difference between "H" and "2H" is of a great significance in commercial use of the antireflection film. In the art, great effort has been made to improve the pencil hardness of the antireflection film by one degree around 2H, e.g., from H to 2H.

....  
Takahashi has no teaching or suggestion that the above-mentioned problem of trade-off between the refractive index and the mechanical strength can be solved by the use of the chain silica fine particles especially when the high temperature sintering should be omitted.

However, even if Takahashi is silent about the hardness of resulting when a coating liquid mixture of chain silica and hydrolyzable group-containing silane is used, nonetheless since Takahashi's teachings encompass the method steps, and the high temperature is merely an optional, the claimed invention fails to exclude Takahashi reference.

Similarly, applicants' arguments at pages 16-20 fail to exclude the collective teachings of prior art.

### **Conclusion**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICTOR S. CHANG whose telephone number is (571)272-1474. The examiner can normally be reached on 6:00 am - 4:00 pm, Tuesday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor S Chang/  
Primary Examiner, Art Unit 1788